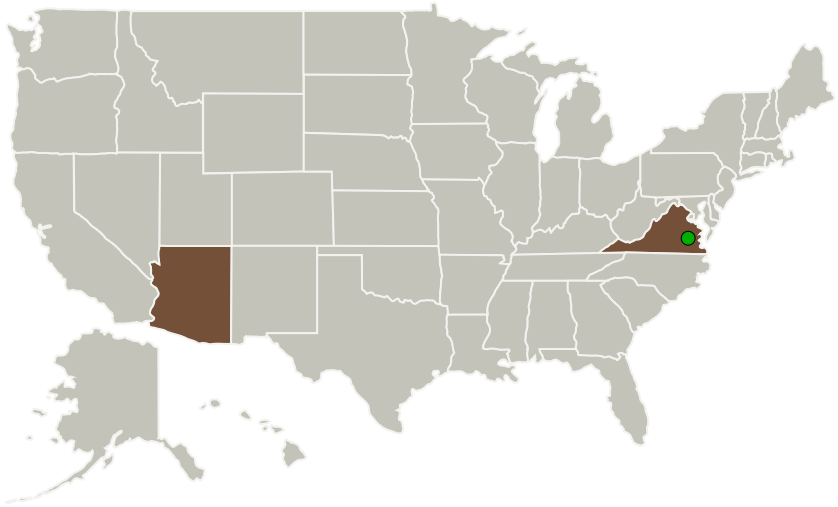
High Power Narrow Linewidth 1.26 Micron Ho-Doped Fiber Amplifier, Phase II

Completed Technology Project (2011 - 2013)

Project Introduction

This proposal is for the development of an innovative, high power, and extremely reliable 1.26-micron Ho-doped fluoride fiber amplifier. The proposed fiber amplifier consists of a Ho-doped fluoride fiber pre-amplifier and power amplifier. Laser at 1187 nm will be used as a resonant pump laser source for Ho3+-doped fiber laser. High gain per unit length at 1.2 micron can be achieved in Ho-doped fluoride glass fiber due to the strong pump absorption at 1187 nm and strong emission at 1.2 micron transition. The proposed Ho-doped fiber amplifier will be implemented into a MOPA system with a 1.26 micron single frequency Ho-doped fiber laser. This type of fiber based seed laser is needed for remote sensing of O and O -N for measuring atmospheric pressure. Concurrent on-board O2 measurements using lines at 1.26 ìm to allow for the best relative compensation for aerosol scattering along the line-of-sight of the CO2 and O2 measurements. The particular O2 band was chosen so that the surface and atmospheric scattering characteristics from aerosols and thin clouds would be nearly the same as for the measurement of CO2 at 1.57 ìm. It's part of program to provide space-based active measurements of CO2 for Active Sensing of CO2 Emissions over Nights, Days, and Seasons (ASCENDS) Mission.

Primary U.S. Work Locations and Key Partners



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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
NP Photonics, Inc.	Lead Organization	Industry	Tucson, Arizona
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Arizona	Virginia

Project Transitions

June 2011: Project Start

May 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138928)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

NP Photonics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

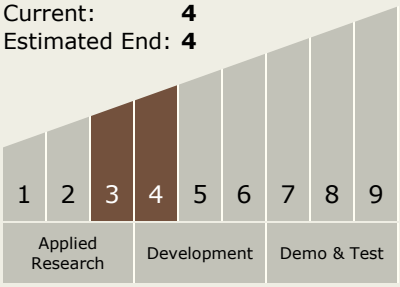
Carlos Torrez

Principal Investigator:

Jianfeng Wu

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System